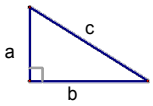
Name
Course you would like to take next year
211 honors math analysis
222 2-level math analysis

Seat request?

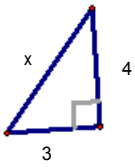
7.1 Apply the Pythagorean Theorem

Thm 7.1--The Pythagorean Theorem--In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs

$$c^2 = a^2 + b^2$$



President Garfield



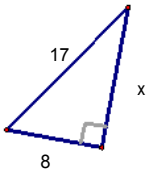
$x^2 = 3^2 + 4^2$

$9 + 16$

$x^2 = 25$

$x = \pm 5$

$x = 5$



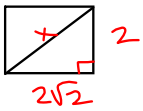
$17^2 = x^2 + 8^2$

$289 = \quad 64$

$225 = x^2$

$15 = x$

Find the diagonal of the rectangle with width of 2 and a length of $2\sqrt{2}$



$x^2 = 2^2 + (2\sqrt{2})^2$

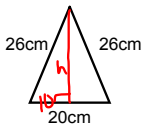
$x^2 = 4 + 8$ (4 · 2)

$\sqrt{x^2} = \sqrt{12}$

$\sqrt{4}\cdot\sqrt{3}$

$x = 2\sqrt{3}$

Find the area of the isosceles triangle.



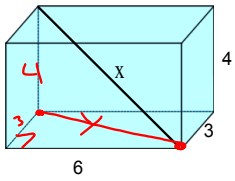
$A = \frac{1}{2}bh$

$26^2 = h^2 + 10^2$

$24 = h$

$A = \frac{1}{2}\,20 \cdot 24$

$240\ cm^2$



$y^2 = 3^2 + 6^2$

$y^2 = 9 + 36$

$y^2 = 45$

$x^2 = y^2 + 4^2$

$x^2 = 45 + 16$

$x^2 = 61$

$x = \sqrt{61}$

Pythagorean Triples

3 4 5 { 5 12 13 { 8 15 17 { 7 24 25

10 24 26

6 8 10

9 12 15

7.2 Use the Converse of the Pythagorean Theorem

Theorem 7-2 The Converse of the Pythagorean Theorem--If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle.

$c^2 = a^2 + b^2$ Right

$c^2 > a^2 + b^2$ Obtuse

$c^2 < a^2 + b^2$ Acute

C is the largest #

Examples

3, 7, 8 $8^2 \overset{?}{>} 3^2 + 7^2$

Obtuse $64 > 9 + 49$

8, 16, 17 $17^2 \overset{?}{<} 8^2 + 16^2$

Acute $289 < 320$

$\sqrt{5}$ $\sqrt{20}$ 6

Obtuse $6^2 \overset{?}{>} \sqrt{5}^2 + \sqrt{20}^2$

The sides and classification of a triangle given below. The length of the longest side is the integer given. What value(s) of x make the triangle?

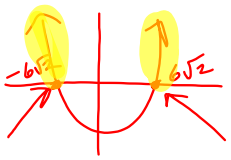
ex 1: x, x, 12; acute

$12^2 < x^2 + x^2$

$144 < 2x^2$

$72 < x^2$

$0 < x^2 - 72$



$x^2 - 72 = y$

$\sqrt{x^2} = \sqrt{72}$

$x = \pm 6\sqrt{2}$

Where is graph greater than zero?

$x < -6\sqrt{2}$ OR $x > 6\sqrt{2}$

But must be a $\triangle$.

x, x, 12

$2x > 12$

$x > 6$

ex 2: 2x, 2x + 6, 30; obtuse

$30^2 > (2x)^2 + (2x+6)^2$

$900 > 4x^2 + 4x^2 + 24x + 36$

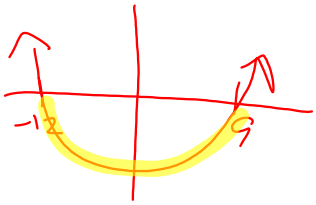
$0 > 8x^2 + 24x - 864$

$0 > x^2 + 3x - 108$

$0 > x^2 + 3x - 108$

$(x+12)(x-9)$

$x = -12 \quad x = 9$



$-12 < x < 9$

$6 < x < 9$

Is it a △

$2x$

$2x+6$

30

$4x+6 > 30$

$4x > 24$

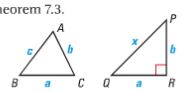
$x > 6$

ex 3: x+2, x+4, $\sqrt{10}$; obtuse

40. PROVING THEOREM 7.3 Copy and complete the proof of Theorem 7.3.

GIVEN ▶ In $\triangle ABC$, $c^2 < a^2 + b^2$ where c is the length of the longest side.

PROVE ▶ $\triangle ABC$ is an acute triangle.



Plan for Proof Draw right $\triangle PQR$ with side lengths a, b, and x, where $\angle R$ is a right angle and x is the length of the longest side. Compare lengths c and x.

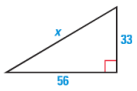
STATEMENTS	REASONS
1. In $\triangle ABC$, $c^2 < a^2 + b^2$ where c is the length of the longest side. In $\triangle PQR$, $\angle R$ is a right angle.	1. ?
2. $a^2 + b^2 = x^2$	2. ?
3. $c^2 < x^2$	3. ?
4. $c < x$	4. A property of square roots
5. $m\angle R = 90°$	5. ?
6. $m\angle C < m\angle$?	6. Converse of the Hinge Theorem
7. $m\angle C < 90°$	7. ?
8. $\angle C$ is an acute angle.	8. ?
9. $\triangle ABC$ is an acute triangle.	9. ?

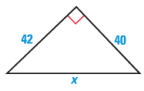
HW
p436-438 #s 3-5, 8,11-13, 24, 29
p444 #s 15-23

+ 40

ALGEBRA Find the length of the hypotenuse of the right triangle.

3. 

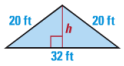
4. 

5. 

8. 

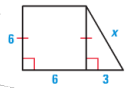
FINDING THE AREA Find the area of the isosceles triangle.

11. 

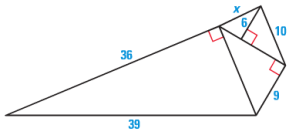
12. 

13. 

FINDING SIDE LENGTHS Find the unknown side length x. Write your answer in simplest radical form.

24. 

CHALLENGE In Exercises 29 and 30, solve for x.

29. 

CLASSIFYING TRIANGLES In Exercises 15–23, decide if the segment lengths form a triangle. If so, would the triangle be *acute*, *right*, or *obtuse*?

15. 10, 11, and 14	**16.** 10, 15, and $5\sqrt{13}$	**17.** 24, 30, and $6\sqrt{43}$
18. 5, 6, and 7	**19.** 12, 16, and 20	**20.** 8, 10, and 12
21. 15, 20, and 36	**22.** 6, 8, and 10	**23.** 8.2, 4.1, and 12.2